IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	)	Attorney Docket No. 080743165002
Heideman et al.	)	
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Serial No.: 09/693,803	)	
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Filed: October 20, 2000	)	
	)	
For: INTEGRATED OPTICAL LIGHTGUIDE DEVICE	)	
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Examiner: Kang, Juliana	)	
	)	
Group Art Unit: 2874	)	
	)	
Confirmation No.: 8677	)	

AMENDMENT TO CLAIMS

Claim 1-13, 16, 17, 18, 19, 21, 22, 23, 25 (Cancelled).

Claim 14. (Currently amended) A method for varying the output power of an integrated optical lightguide device comprising the steps of:

providing a lightguide device;

locating a light source at an entrance of said lightguide device;

locating a light detector at an exit of said lightguide device;

transmitting light through said lightguide device in a direction of light propagation;

forming in a non-periodic or arbitrary length distribution different types of segments in said lightguide device, each type of segment having a different refractive index profile in a plane perpendicular to said direction of light propagation wherein the refractive index profile of at least one type of segment is sensitive to an external physical parameter or chemical compound activating said at least one type of segment;

using refractive index profile dependent attenuation of guided modes passing transitions between two different segments; and

~~wherein A method as claimed in claim 25, said activable light guide activable light guide device comprises~~ providing a lightguide ~~light guide~~ channel including ~~an inclusion layer and/or~~ a light transmitting layer of an electro-optical material, wherein, in order to obtain light modulation, activating segments of one type ~~are activated~~ by means of an electrical potential difference between two electrodes patterned in an electrically conductive intermediate layer on either side of said lightguide ~~light transmitting~~ channel.

Claim 15. (Currently amended) A method for varying the output power of an integrated optical lightguide device comprising the steps of:

providing a lightguide device;

locating a light source at an entrance of said lightguide device;

locating a light detector at an exit of said lightguide device;

transmitting light through said lightguide device in a direction of light propagation;

forming in a non-periodic or arbitrary length distribution different types of segments in said lightguide device, each type of segment having a different refractive index profile in a plane perpendicular to said direction of light propagation wherein the refractive index profile of at least one type of segment is sensitive to an external physical parameter or chemical compound activating said at least one type of segment;

using refractive index profile dependent attenuation of guided modes passing transitions between two different segments; and

~~A method as claimed in claim 25,~~ wherein use is made of ~~an inclusion layer and/or~~ a light transmitting layer comprising a thermo-optical material and wherein activating segments of one type ~~are activated~~ by means of an electrical current driven through an electrical conducting intermediate layer introducing a segment pattern corresponding with a predetermined pattern of segments activated by an ~~the~~ external physical parameter or chemical compound.

Claim 20. (Currently amended) A method for determining a physical or chemical parameter using an integrated optical lightguide device comprising the steps of:

providing a lightguide device;

locating a light source at an entrance of said lightguide device;

locating a light detector at an exit of said lightguide device;

transmitting light through said lightguide device in a direction of light propagation;

forming in a non-periodic or arbitrary length distribution several types of segments in said lightguide device, each type of segment having a different refractive index profile in a plane perpendicular to the direction of light propagation wherein the refractive index profile of at least one type of segment is sensitive to an external physical parameter or chemical compound activating said at least one type of segment;

using refractive index profile dependent attenuation of guided modes passing transitions between two different segments;

measuring an amount of light entering said lightguide device in the form of one or more guided modes;

measuring an amount of light leaving the lightguide device in the form of guided modes; and

determining a ratio between the amount of light entering said lightguide device and the amount of light leaving said lightguide device, ~~A method as claimed in claim 25,~~ wherein said lightguide ~~light guide~~ device comprises two types of segments S_1~~S1~~ and S_2~~S2~~, wherein S_1~~S1~~ is activated by a quantity A and S_2~~S2~~ is activated by a quantity B different from A and wherein S_1~~S1~~ and S_2~~S2~~ are incorporated in a feedback circuit and wherein ~~generating~~, based on ~~a criterion of~~ a constant transmission by the lightguide ~~activable light guide~~ device, a relationship of a ~~the relative~~ refractive index profile of S_2~~S2~~ ~~is maintained at a value equal~~ to that of ~~the~~ a refractive index profile of S_1~~S1~~ is maintained by applying a suitable value B, from which ~~to correlate~~ the quantity A is deduced ~~with a set value of quantity B~~.

Claim 24. (Currently amended) An optical lightguide device comprising:

a light source at an entrance side;

a light detector at an exit side;

an integrated optical lightguide device wherein a light transmitting layer comprises an electro optical material in which an electric potential difference is applied between a first electrically conductive layer deposited on a first side of said electro optical material and a second electrically conducting layer deposited on an opposite side of said electro optical material wherein an electrode pattern is formed; and

a series of two types of segments spaced in a non-periodic manner along a direction of light propagation, which non-periodic manner is determined by the electrode pattern wherein one type of segment shows a refractive index distribution in a plane perpendicular to the direction of light propagation which is a function of said applied electrical potential difference

~~An integrated optical light guide device as claimed in claim 21, wherein an inclusion layer and/or a light transmitting layer comprise an electro-optical material, in which layer local segment~~

~~forming activation is realized by means of an electrical potential difference to be applied between a first electrically conducting layer deposited on a first side of said electro-optical layer, and a second electrically conducting layer deposited on an opposite side of said electro-optical layer in which layer an electrode pattern is formed corresponding to a predetermined segment pattern~~.

Claim 26. (New) An integrated optical device comprising:

a light path having a direction of propagation;

a first structure extending along said light path, said first structure having light transmitting properties at a first refractive index distribution in a plane perpendicular to the direction of light propagation;

a second structure extending along said light path and in optical communication with said first structure, said second structure having light transmitting properties at a second refractive index distribution in a plane perpendicular to the direction of light propagation, said second refractive index distribution being different from said first refractive index distribution; and

a third structure extending along said light path and in optical communication with said second structure, said third structure having at least a plurality of first and second segments, each segment of said plurality of first segments having a refractive index distribution in a plane perpendicular to the direction of light propagation which is different from a refractive index distribution in a plane perpendicular to the direction of light propagation of each of said segments of said plurality of second segments, and each segment of said plurality of first segments being generally of unequal length compared to other segments of said plurality of first

segments in the direction of said light path wherein a change in the amount of light transmitted by said integrated optical device is a function of a parameter being sensed.

27. (New) The device of claim 26 wherein:

the lengths of said segments of said plurality of first segments are formed arbitrarily.

28. (New) The device claim 26 wherein:

said segments of said plurality of first segments are unevenly distributed.

29. (New) The device of claim 26 wherein:

said segments of said plurality of first segments have depths which are generally unequal.

30. (New) The device of claim 26 wherein:

said change in the amount of light is generally independent of wavelength.

31. (New) The device of claim 26 wherein:

said segments of said plurality of first segments have various geometric shapes.

32. (New) An integrated optical device comprising:

a first light transmitting structure having a first refractive index distribution in a plane perpendicular to the direction of light propagation;

a second light transmitting structure of active material having a second refractive index distribution in a plane perpendicular to the direction of light propagation in optical communication with said first light transmitting structure, said second structure having a plurality of first segments of a first width alternating with a plurality of second segments of a second width, the segments of said of plurality of first segments being of generally unequal lengths, and the mode profile of each of said segments is, at a given value of an activating

parameter, substantially the same and will vary oppositely upon variation of the parameter being sensed.

33. (New) An integrated optical device comprising:

a first light transmitted structure;

a second light transmitting structure, said second light transmitting structure being a strip all of which is initially of active material, said strip being locally deactivated resulting in said strip containing segments of active material alternating with segments of non-active material.

34. (New) An integrated optical device comprising:

a first light transmitting structure having a ridge;

a second light transmitting structure in optical communication with said ridge of said first light transmitting structure, said second light transmitting structure having alternate segments of active material and deactivated material.

35. (New) An integrated optical device comprising:

a first light transmitting structure;

a second light transmitting structure having segments of alternating active material and non-active material, wherein initially both active and non-active material segments have different refractive index distributions and when a sensed parameter obtains a predetermined value the refractive index distribution of said segments of active material has changed to such a value that it generally matches the refractive index distribution of said segments of non-active material.

36. (New) An integrated optical device comprising:

a first light transmitting structure; and

a second light transmitting structure having alternating segments S_1 and S_2 wherein changes to the refractive index distribution of said segments S_1 are caused by a change in one parameter from a first group of parameters consisting of magnetic field, temperature, force and chemical concentration, and changes to the refractive index distribution of said segments S_2 is caused by a change in one parameter from a second group of parameters consisting of temperature, magnetic field, electric field and force provided that the parameter of said second group is not the parameter of said first group that caused the change in refractive index distribution of said segments S_1.